

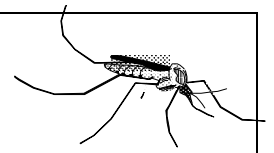
*Metropolitan Washington Council of Governments  
Regional Health Officers Committee*

*West Nile Virus Response Plan*

*West Nile Virus Planning for Northern Virginia, Maryland,  
and the District of Columbia*

*A cooperative effort by local, state and federal agencies, municipal  
and county governments, the military, and the public*

West Nile Virus Response Group  
July 6, 2000



## INTRODUCTION

New York City, in the summer of 1999, had the distinction of being the site of the first outbreak of the West Nile arbovirus in the western hemisphere. As a source of outbreaks in Africa, the Middle East and Europe, it had already shown itself capable of inflicting illness upon hundreds, and sometimes thousands of victims. The discovery of the disease in our largest metropolitan area raised the specter of a major illness event for which the United States was unprepared.

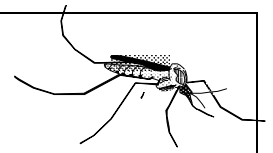
Fortunately, the timing of the outbreak and prompt response by federal, state, and city officials led to a cessation in the spread of the virus as the autumn season advanced. However, concern that the virus could winter-over in the New York area, combined with the potential for the organism to survive in the migrating bird population, led health officials to correctly conclude that reappearance of the disease was distinctly possible.

Consequently, the National Centers for Disease Control urged states and local jurisdictions along the Atlantic coast bird migration route to plan for the possibility of another outbreak of the West Nile virus. Surveillance of the bird and insect populations was then initiated. Jurisdictions began to meet to coordinate activities and identify local risks of mosquito-borne disease.

In Northern Virginia, the West Nile Virus Response Group was formed in December 1999 to develop just such a response plan. It soon became obvious that other closely associated communities also needed to be included in the planning. Eventually, Montgomery County, Maryland and the District of Columbia joined Northern Virginia to create a truly regional approach to West Nile planning.

On May 7, 2000, the Regional Health Officers Committee of the Metropolitan Washington Council of Governments received and reviewed the draft of this plan. The committee then unanimously adopted the submitted draft as the response plan for the region. In further discussion:

- 1) The Health Officers Committee also agreed that the local health officer would be the designated coordinator of the plan, working in cooperation with applicable state response plans and with other governmental agencies and private entities;



2) The Health Officers Committee adopted the policy that if one jurisdiction of the planning region was elevated to a higher risk level by a change in the virus activity in that area, then all jurisdictions in the planning region would also be elevated to that level. However, each jurisdiction would implement only those response activities applicable to the current likelihood of West Nile disease in that particular locality.

3) The Health Officers Committee also recommended to area jurisdictions to immediately institute public health education activities regarding West Nile virus and to initiate mosquito breeding site reduction activities, even utilizing local health menace ordinances where available;

3) Finally, the West Nile Virus Response Group was established as a permanent committee charged with conducting pre-season and post-season review of the adopted West Nile Virus Response Plan and associated seasonal activities.

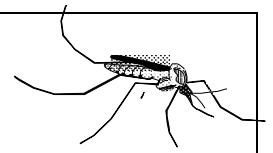
#### Acknowledgements

*The response plan was the product of the efforts of many individuals, representing numerous and varied disciplines. Their combined efforts and knowledge were essential to developing this project. Therefore, each of these participants rightfully deserves all the acknowledgements and credit for their work.*

*Particular thanks should also go to organizations which provided direct or indirect assistance and guidance, including the New York State West Nile Planning Committee, Centers for Disease Control, Virginia Department of Health (Office of Epidemiology), Department of Health and Human Services (Montgomery County, MD), Norfolk City Health Department (Norfolk, VA), and the Division of Occupational and Environmental Health (Quantico Marine Corps Base, VA).*

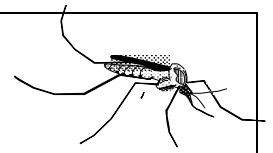
*A special thanks goes to the City of Manassas, Virginia for providing the excellent meeting facilities and technical support that enabled the planning committee to efficiently carry out its duties.*

*Earl L. Tester, Jr., Chairman  
West Nile Virus Response Group  
July 6, 2000*



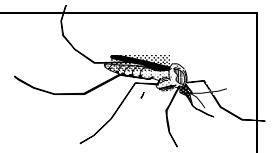
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## FORWARD

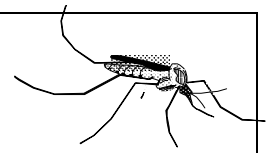
This plan outlines activities and resources suitable for implementing a response to the threat of a West Nile virus outbreak in a locality. It supplements the state response plans developed in Maryland and Virginia and is closely dependent upon the central coordination of the state procedures and resources defined in those documents. Where those plans may be viewed as more global in nature, this plan may be seen as a day-to-day working document that identifies various specific programs of monitoring, vector elimination, education, and local coordination.

The format of this plan is based upon CDC's *Guidelines for Arbovirus Surveillance in the U.S.* and uses the risk level approach to planning and response proposed in that document. Should the need arise, the user will find a systematic layout of recommended activities suitable for implementation during the seasonal advancement of the disease in the animal and human populations. Also included are many resources and a timeline chart which identifies off-season planning activities that will facilitate an effective response during the following mosquito breeding season.

The plan is general in nature, recognizing the particular and unique circumstances that exist in each jurisdiction. However, the response tools themselves are derived from sources well versed in arbovirus monitoring and control. Therefore, in this plan, each district should find information and resources appropriate to its needs with which to formulate its own response activities.

Also, recognizing the importance of keeping local officials apprised of the West Nile virus and response planning, an executive summary is provided which briefly explains all in suitable detail. It may be used as provided or edited to meet local needs.

Finally, this document is intended to facilitate communication and cooperation between the regional jurisdictions whose boundaries touch and, as such, share the risk of rapid spread of the West Nile Virus and other arbovirus diseases.



## **Planning Committee - Organizations & Agencies**

### ***City of Alexandria, Virginia***

Health Department

### ***County of Arlington, Virginia***

Department of Human Services, Public Health

Office of the County Manager, Public Information

### ***City of Manassas, Virginia***

Public Works

Animal Control

Citizens Representative

### ***City of Manassas Park, Virginia***

Public Works

### ***City of Norfolk, Virginia***

Health Department, Office of Mosquito Control

### ***City of Washington, D. C.***

Health Department

Animal Control

### ***Fairfax County, Virginia***

Health Department

Park Authority

### ***Fauquier County, Virginia***

Fauquier Hospital, Infection Control

### ***Fort Belvoir, U.S. Army***

Wildlife Biology

### ***Loudoun County, Virginia***

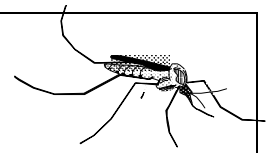
Health Department

### ***Marine Corps Base, Quantico***

Div. of Occupational and Environmental Health

Public Works

Cartography and GIS systems



## **Planning Committee - Organizations & Agencies (cont.)**

### ***Marine Corps Base, Quantico (cont.)***

Fish, Wildlife & Agronomy Section

### ***Montgomery County, Maryland***

Department of Health and Human Services

### ***Office of Epidemiology, Virginia Department of Health***

Epidemiology

### ***Potomac Hospital, Woodbridge, Virginia***

Infection Control

### ***Prince William County, Virginia***

Health Department

Public Works

Animal Control

Public Information

Mosquito Control Office

### ***Prince William Forest Park, National Park Service***

### ***Prince William Hospital, Manassas, Virginia***

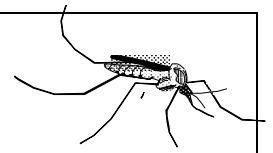
Infection Control

### ***Prince William Soil & Water Conservation District***

Agriculture and Farm Assistance

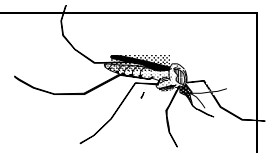
### ***Virginia Department of Game and Inland Fisheries***

Wildlife Biology



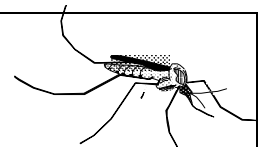
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## Executive Summary

### **Plan Concept**

The concept of this plan is based upon the combined surveillance of the human, insect, bird and mammal populations for indications of the presence of the West Nile virus. As the primary vector, the mosquito becomes the key to the evolution of the response to the disease. In this regard, the mosquito species identified, as well as their location and population numbers assist in determining the current risk to the community and necessary action plans based upon that perceived risk. In all cases, it is expected that the response to West Nile virus will be a measured one that targets only those areas where there is a confluence of people, mosquitoes, and virus. The planning and response actions are categorized into five major groups of activities: 1) Mosquito Surveillance; 2) Mosquito Control; 3) Bird/Mammal Surveillance; 4) Human surveillance; 5) Public Information.

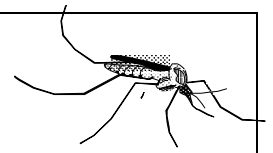
### **Mosquito Surveillance**

Mosquito surveillance will allow risk assessment and planning, if the virus is found in the region. Initial activities will involve passive measures of trapping, speciating, and determining population densities of local mosquitoes. There is a differential risk of disease transmission based upon the presence of identified mosquito carriers and their densities. Therefore, identifying mosquito-breeding sites for elimination or treatment, particularly those located near susceptible human populations, will be a continuous and critical effort. Continuous adult mosquito monitoring throughout the season will be essential to the prompt response to any evidence of the disease in local animal or human populations.

### **Mosquito Control**

The safest and most useful approach is to prevent mosquito breeding by eliminating unnecessary pools of water, maintaining swimming pools, birdbaths, etc. Jurisdictions, which have ordinances prohibiting the breeding and harborage of disease-causing insects, should enforce such codes.

Early season control activities are typically limited to breeding site reduction efforts since reducing the adult mosquito population directly reduces the chances of mosquito-borne disease transmission later. Some localities routinely conduct larviciding and some adulticiding as a nuisance reduction measure. The decision to move from this level of control to more aggressive strategies will be determined jurisdiction by jurisdiction. Should there be a significant human disease incidence, a regional approach is then recommended. Limited adult mosquito control to include truck fogging and, ultimately, aerial pesticide application is expected to involve intensive discussion and planning between the local, state and federal jurisdictions before implementation.



### **Avian/Mammal Surveillance**

Birds are considered the primary host for West Nile virus. Mammals, particularly horses, can also be infected with the disease and thus provide a mechanism for identifying the presence of the organism in the community. Protocol has been established to collect and test dead indicator birds (crows and blue jays). Flock bird kills and dead mammals will be collected and tested in cooperation with the U.S. Fish and Game (USDA) and the State Department of Agriculture.

### **Human Surveillance**

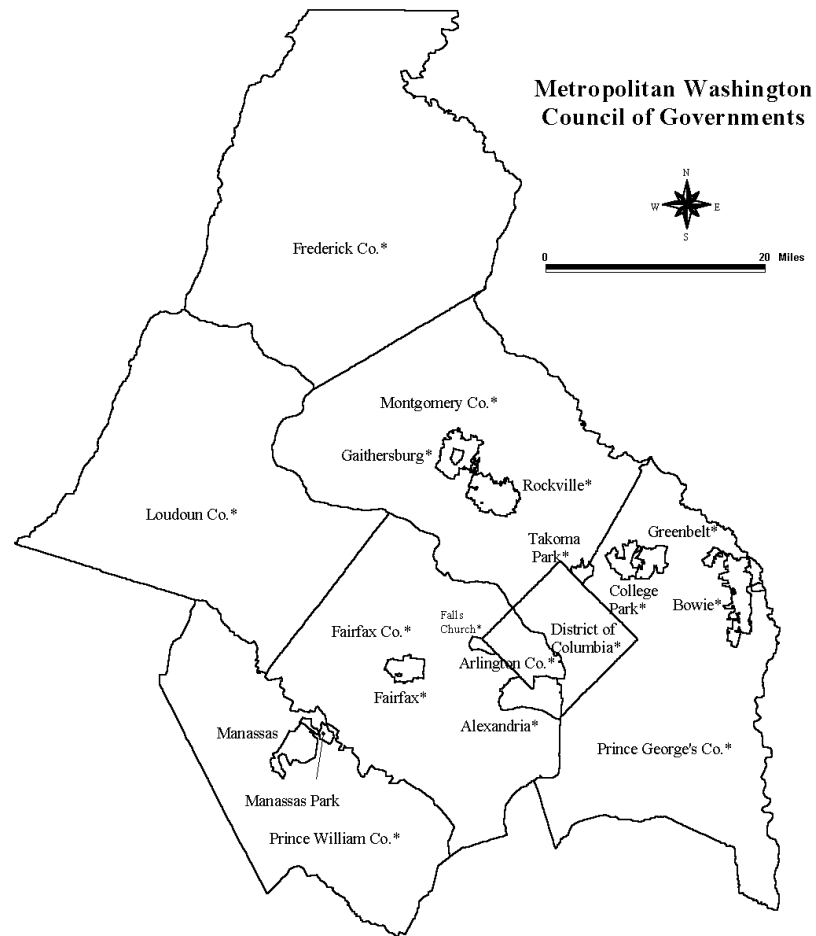
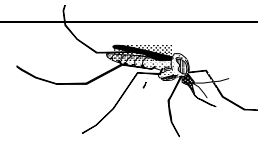
Virginia, Maryland and the District of Columbia will conduct human surveillance. Increased passive monitoring for encephalitic disease will be the first step, with active surveillance undertaken if human cases are identified or if other indicators of the presence of West Nile virus suggest the need. It is recommended that all three jurisdictions conduct the same level of surveillance.

### **Public Information**

Information dissemination to the public, support communities (health care providers, veterinary communities, etc.) and other governmental entities will be essential for the effective implementation of this plan. Great lengths will be taken to develop bulletins, literature, websites, news briefs and technical briefs that are applicable to each stage of the disease.

### **Risk Levels**

- Level 1 -** Off-season; adult vectors inactive; climate unsuitable; **Activities include** some breeding site reduction and public education
- Level 2 -** Adult vectors active, but not abundant; temperatures not satisfactory for virus  
**Activities (inclusive of level 1) -** source reduction; limited larviciding; vector and virus surveillance
- Level 3 -** Local abundance of adult vectors; **Activities (inclusive of level 2) -** increased surveillance and larviciding; possible adulticiding where indicated
- Level 4 -** Abundant adult vectors; multiple animal infections identified; optimal conditions for extrinsic incubation and vector survival. Multiple virus isolations from Enzootic hosts *or a confirmed human or equine case*. **Activities (inclusive of level 3) -** Regional Health Officers will meet to review situation, planned response and determine needed additional response steps that may include but are not limited to 1) Adulticiding in high risk areas; 2) Expanded public information; 3) Active surveillance for additional human cases.

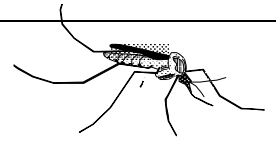


\*Members of the Metropolitan Washington Council of Governments



## SEASONAL PLANNING CALENDAR

[illegible]



**Risk Level:**        ***1***

**Probability of Outbreak:**    *Negligible or none*

**Definition:**   Off-season; adult vectors inactive climate unsuitable

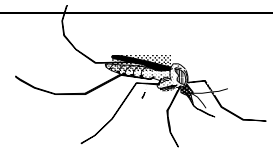
**CDC Recommended Responses**    None required; may pursue source reduction and public education

### **Coordinated Response Activities**

1.     Arrange meeting between Local Health Department (LHD), Public Works and other response agencies to confirm and coordinate preseason activities
2.     Coordinate multi-jurisdictional response activities for affected areas along shared jurisdictional boundaries

### **Mosquito Surveillance Activities**

1.     Establish full-time position for a local mosquito control coordinator
2.     Conduct mosquito larval surveys - larval dip evaluations
3.     Conduct adult mosquitoes count surveys
4.     Survey and identify water bodies for future monitoring
5.     Obtain area maps for use in monitoring activities
6.     Determine central depository for mosquito survey results and method of sharing information
7.     Determine protocol and testing lab for mosquitoes



## **Risk Level 1 Activities (cont.)**

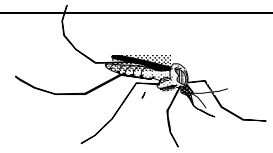
### **Mosquito Control Activities**

***\*\*\* It should noted, that before embarking on a program of local mosquito control, approved training and certification in the proper use and application of pesticides must be obtained from authorized state and/or federal agencies.***

1. Determine local preference for own mosquito control program or contract work
2. Obtain equipment, supplies, permits, and training for local control program
3. Identify, interview, and contract with commercial company for out-resource control program
4. Arrange meeting between Local Health Department and Public Works to confirm and coordinate seasonal mosquito breeding site reduction efforts
5. Establish biological control program - fish breeding (refer to N.J. program)
6. Initiate mosquito breeding site reduction activities (water channeling, ditch maintenance, etc.)

### **Avian & Mammal Surveillance Activities**

1. Arrange meeting between Local Health department, Department of Agriculture, zoo operators, animal control officers, veterinarians, livestock breeders, etc. and other appropriate parties to confirm and coordinate pre-season activities
2. Identify local zoos, exotic pet owners, livestock and poultry breeders in jurisdiction; solicit these animal owners to participate as sentinel monitors with reporting responsibilities in the event of unusual animal illnesses or mortality.
3. Notify local animal rehab people, animal control officers, veterinarians, and others of WN virus preparations.
4. Local health department and Dept. of Agric. should meet with those in #1
5. Determine protocol and testing lab for dead birds and mammals
6. Determine internal procedures for collecting and transporting bird and mammal specimens to the lab in each district



## **Risk Level 1 Activities (cont.)**

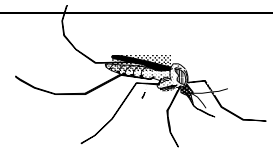
7. Issue letter to Veterinary community regarding WN virus
8. Determine the agency (Health Department or other designated agency) that will issue an animal specimen tracking number to citizens delivering carcasses of protected birds and animals for testing

### **Human Surveillance Activities (see Maryland & Virginia State Plans & Addendum)**

1. Arrange meeting between Local Health Departments, hospital Infection Disease Control Practitioners, HMO representatives, local health care community representatives, etc. and Other appropriate parties to confirm and coordinate preseason activities
2. Insure dissemination of West Nile virus information to health care community
3. Institute passive surveillance and reporting
4. Identify local contacts in the health care community and prepare notification list (see notification list, page 41)
5. Identify spokesman in LHD to answer questions from the health care community
6. Compile and distribute region wide list of contacts and phone numbers

### **Public Information Activities**

1. Arrange meeting between Local Health Department and local public information officials and other appropriate parties to confirm and coordinate preseason activities
2. Prepare and distribute mosquito breeding prevention brochures, newsletters, etc. for mass distribution (schools, senior centers, libraries, hcf, multi-lingual)
3. Issue press release for risk level 1, plus press release background briefing (TEMPLATE #1 or similar)
4. Arrange for Cable television spot on WN virus information
5. Conduct presentation to local Board of County Supervisors or to City Council
6. Identify LHD spokesman for questions from public



**Risk Level:**            **2**

**Probability of Outbreak:**        ***Remote***

**Definition:** Spring, summer, or fall; adult vectors active but not abundant; ambient temperature not satisfactory for viral development.

**CDC Recommended Responses:** Source reduction; use larvicides at specific sources identified by entomology survey; maintain vector and virus surveillance

### **Coordinated Response Activities**

1. Coordinate multi-jurisdictional response activities for affected areas along shared jurisdictional boundaries

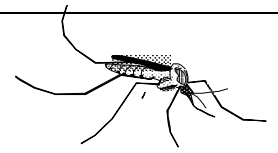
### **Mosquito Surveillance Activities**

1. Survey area and identify potential mosquito breeding sites for reduction activities
2. Determine who is going to do larviciding
3. Obtain supplies, permits and training for in-house program, equipment
4. Contract with commercial mosquito control company for out-source program

### **Mosquito Control Activities**

***\*\*\* It should noted, that before embarking on a program of local mosquito control, approved training and certification in the proper use and application of pesticides must be obtained from authorized state and/or federal agencies.***

1. Conduct larviciding, as deemed necessary
2. Conduct general mosquito breeding site reduction activities
3. Initiate restricted treatment of protected areas (i.e. culverts, storm water drainpipes)



## **Risk Level 2 Activities (cont.)**

where winter-over mosquito adults are identified

### **Avian & Mammal Surveillance Activities**

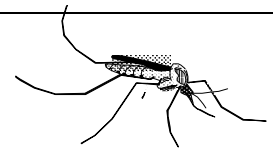
1. Collect birds for laboratory evaluation as protocol dictates
2. Determine need for sentinel flocks and mosquito traps; locate potential sites
3. Obtain funding to support sentinel flocks and establish a maintenance program
4. Place sentinel flocks
5. Arrange for cable television spot for dead crow testing

### **Human Surveillance Activities**

1. Notify and educate Health Care community to report encephalitis/meningitis to LHD for evaluation for further testing for WN virus
2. Set up LHD database and communication systems with surrounding localities and institute weekly data compilation throughout the season
3. Email fact sheets to Health Care community
4. Advertise health alerts on Local Health Department website

### **Public Information Activities**

1. Continue to distribute mosquito breeding prevention brochures
2. Update website
3. Continue cable television information spots
4. Issue press release for level 1-2 (TEMPLATE #1 and #2 or similar)



**Risk Level:**        **3**

**Probability of Outbreak:**        *Possible*

**Definition:** Focal abundance of adult vectors. Temperature adequate for intrinsic incubation; Seroconversion in sentinel hosts (see #1).

**CDC Recommended Responses:** Response from #1; increase larvicidal use in urban areas; initiate selective adulticide use; increase vector and virus surveillance.

#### **Coordinated Response Activities**

1. Notify the local and regional response agencies that a positive finding has been identified in a sentinel host
2. Coordinate multi-jurisdictional response activities for affected areas along shared jurisdictional boundaries

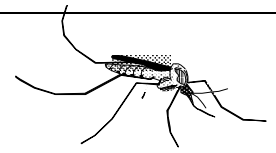
#### **Mosquito Surveillance Activities**

1. Increase vector and virus surveillance
2. Continue larval and adult surveying and testing

#### **Mosquito Control Activities**

***\*\*\* It should noted, that before embarking on a program of local mosquito control, approved training and certification in the proper use and application of pesticides must be obtained from authorized state and/or federal agencies.***

1. Increase larviciding in selected areas, as needed
2. Initiate selective adulticiding, as necessary and feasible
3. Larvicide extensively in area of a seroconverted sentinel flock or positive trap
4. Conduct pretreatment and post-treatment surveillance



## **Risk Level 3 Activities (cont.)**

### **Avian & Mammal Surveillance Activities**

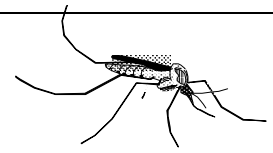
1. Collect birds for laboratory evaluation as protocol dictates
2. Increase mammal surveillance
3. Notify the Veterinary community and others associated with avian and mammal operations that a positive finding has been identified in a sentinel host

### **Human Surveillance Activities**

1. Notify Health Care community (see Contacts & References) that a case has been identified in a sentinel host
2. Notify area labs of identification of sentinel host infection. All arboviral testing should be done on a STAT basis
3. Distribute physician's fact sheet to physicians, including patient care information and signs and symptoms of encephalitis
4. Notify CDC & regional contacts

### **Public Information Activities**

1. Arrange special briefings for senior centers, civic associations
2. Arrange the same interviews to local media
3. Continue distribution of education materials
4. Issue press release for Level 2 (TEMPLATE #3 or similar)



**Risk Level:**        **4**

**Probability of Outbreak:**        *Probable*

**Definition:** Abundant adult vectors in most areas; multiple virus isolations from Enzootic hosts *or a confirmed human or equine case*; optimal conditions for extrinsic incubation and vector survival; these phenomena occur early in the “normal” season for viral activity.

**CDC Recommended Responses:**

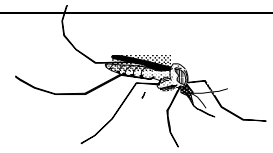
***Implement emergency control contingency plan***; Response in category 2 plus: Adulticiding in high risk areas; expand public information program (use of repellents; personal protection, avoidance of high vector contact areas); initiate hospital surveillance for human cases.

### **Coordinated Response Activities**

1.     **The Regional Health Officers Committee of the Metropolitan Washington Council of Governments will meet in emergency session at the first sign of human virus.**
2.     Notify the local and regional response agencies that multiple positive enzootic findings have been identified
3.     Coordinate multi-jurisdictional response activities for affected areas along shared jurisdictional boundaries

### **Mosquito Surveillance Activities**

1.     Dedicate staff to full-time surveillance duties
2.     Increase mosquito surveying, particularly in high-risk areas and in the area where the positives were identified



## **Risk Level 4 Activities (cont.)**

### **Mosquito Control Activities**

***\*\*\* It should noted, that before embarking on a program of local mosquito control, approved training and certification in the proper use and application of pesticides must be obtained from authorized state and/or federal agencies.***

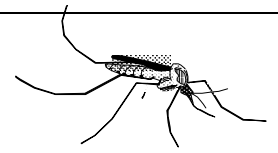
1. Institute mosquito adulticiding in high-risk areas
2. Re-survey and larvicide, as needed, in the areas of positive findings
3. Re-survey and intensify mosquito breeding site reduction in positive areas
4. Conduct pretreatment and post-treatment surveillance

### **Avian & Mammal Surveillance Activities**

1. Increase surveillance in high-risk areas and particularly in areas of positive findings
2. Update public awareness fact sheets for public information officials
3. Test animals that have exhibited neurological symptoms
4. Have animals that have been submitted for rabies test also be tested for WN virus

### **Human Surveillance Activities**

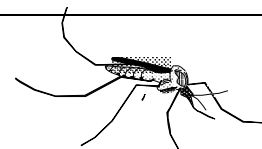
1. Institute active surveillance of sentinel acute care hospitals
2. Institute active surveillance at other hospitals, laboratories, primary care practices, infectious disease doctors, neurology practices, and military medical facilities
3. Start Epidemiological investigation(s) on human case(s)
4. Update CDC and regional contacts
5. Expand public information program (use of repellents; personal protection, avoidance of high vector contact areas)



## **Risk Level 4 Activities (cont.)**

### **Public Information Activities**

1. Issue press release for levels 3 (TEMPLATE #4 or similar)
2. Continue expert interviews
3. Arrange Cable television infospots on symptoms
4. Activate hot line for public/hcp for information



## Appendix A

### Glossary

**Abate** ® – a brand name of temephos insecticide. It is a non-systemic organophosphate insecticide used to control mosquito, midge, and black fly larvae in lakes, ponds, and wetlands.

**Adulticide** – a pesticide targeted at the adult stage of insects.

**Agnique** ® - a monomolecular light viscosity oil that spreads quickly and evenly over water. This interferes with the larval mosquito's ability to obtain oxygen from the surfaces of the water.

**Altosid** ® - a brand name of methoprene insecticide. It is an insect growth regulator (IGR), which acts by inducing morphological changes interfering with normal development.

**Anvil** ® – a brand name insecticide that contains sumithrin, piperonyl butoxide, and petroleum solvents. Sumithrin is a synthetic pyrethroid. It is designed to kill adult insects on contact, and break down very quickly.

**Arbovirus** – any of several togaviruses that are transmitted by bloodsucking arthropods, as ticks, fleas, or mosquitoes, and may cause encephalitis, yellow fever, or dengue fever.

**Aspirator** – a simple device, made of a small hand-held collection glass tube with an attached narrow rubber tube used to manually capture live adult mosquitoes for identification and/or testing. Aspirators are used in combination with landing counts.

**Bactomos** ® - a brand name of *Bacillus thuringiensis*, Berliner var. *israelensis* (B.t.i.). A biorational insecticide used to control mosquito larvae.

**CDC** – Center for Disease Control and Prevention

**CDC Light Trap** – a mosquito trap that used a light and a source of CO<sub>2</sub> to attract adult mosquitoes. CDC traps are more effective than New Jersey light traps.

**C-ELISA** – Capture- Enzyme Linked Immunoassay

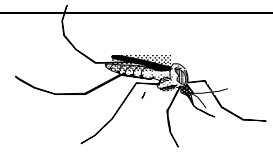
**CSF** – Cerebrospinal fluid

**DCLS** – Virginia Division of Consolidated Laboratory Services

**Dibrom** ® – A brand name of naled insecticide used to kill adult mosquitoes. Can be applied from truck mounted sprays units.

**ELISA** – Enzyme Linked Immunoassay

**Enzootic** – (of a disease) prevailing among or afflicting animals in a particular locality.



## **Glossary (cont.)**

**HCP** – health care professionals

**IGR** - an insect growth regulator insecticide, which acts by inducing morphological changes interfering with normal development. Mosquito larvae develop to pupal stage where they die.

**Kill jar** – a container containing a toxin used to kill insects for examination / collection; the bottom part of a New Jersey light trap.

**Larvicide** – an insecticide targeted at the larval stage of insects. Mosquito larvacides are applied directly to water.

**Naled** – an organophosphate insecticide (Dibrom ®) used to kill adult mosquitoes. Can be applied from truck mounted sprays units.

**Necropsy** – the examination of a body after death; autopsy.

**New Jersey Light Trap** – a large mosquito trap which uses light to attract adults for collection and identification. The main body of the trap is a cylinder with a cone shaped cover, containing a fan, which pulls insects into a funnel and killing jar.

**NPHL** – Norfolk Public Health Laboratory

**RT-PCR** – Reverse Transcriptase Polymerase Chain Reaction

**Seroconverted (sentinel flock)** -

**SLE** – St. Louis Encephalitis

**VDACS** – Virginia Department of Agriculture and Consumer Services

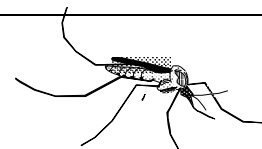
**VDGIF** – Virginia Department of Game and Inland Fisheries

**Vector** – something or someone, as a person or an insect, that carries and transmits a disease –causing organism.

**Vetolex ®** -

**VI** – Virus isolation

**WNVRG** – West Niles Virus Response Group



## Appendix B

# General West Nile Virus Information

## West Nile Virus Infection

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### **What is West Nile virus infection?**

The West Nile virus infection is one that is spread by the bite of infected mosquitoes and usually causes a mild illness, but may also cause encephalitis (inflammation of the brain) or meningitis (inflammation of the lining of the brain and spinal cord). This virus is named after the West Nile region of Uganda where the virus was first isolated in 1937. It caused an outbreak in New York in 1999.

### **Who gets West Nile virus infection?**

Anyone can get West Nile virus infection if bitten by an infected mosquito; however, even in areas where transmission of West Nile virus is known to be occurring only a small proportion of mosquitoes are likely to be infected (1/1000). Even if a person is bitten by an infected mosquito, the chance of developing illness is approximately 1/300. Persons who have weakened immune systems and the elderly are at greater risk of developing a more severe form of the illness.

### **How is West Nile virus spread?**

West Nile virus is spread by infected mosquitoes. A mosquito is infected by biting a bird that carries the virus. West Nile virus is not spread from one person to another, or directly from birds to humans.

### **I've gotten a mosquito bite. Should I be tested for West Nile virus infection?**

No, most mosquitoes are not infected with West Nile virus. See a physician if you develop the symptoms below.

### **What are the symptoms of West Nile virus infection?**

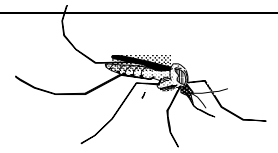
The disease may be mild or serious. Mild illness includes fever and muscle aches, swollen lymph glands and sometimes a skin rash. In the elderly, infection may spread to the nervous system or bloodstream and cause sudden fever, intense headache, and stiff neck and confusion, possibly resulting in encephalitis or meningitis. Healthy children and adults may not have any symptoms.

### **How soon after exposure do symptoms appear?**

The symptoms generally appear about 3 to 6 days after exposure but may appear as soon as 1 day after exposure or as late as 7 or more days.

### **Does past infection with West Nile virus make a person immune?**

Yes, a person who gets West Nile virus probably cannot get it again.



## **General West Nile Virus Information (cont.)**

### **What is the treatment for West Nile virus infection? Is there a vaccine for West Nile virus?**

There is no specific treatment. Supportive therapy will be used in more severe cases.

Most people recover from this illness. There is no vaccine.

### **How can West Nile virus infection be prevented?**

It can be prevented by controlling mosquitoes.

1. Avoid getting mosquito bites by using insect repellants and by wearing protective clothing.
2. Another way to control mosquitoes is to remove standing water where mosquitoes breed. Remove or change water twice a week in anything that collects water around your home. This includes cans, birdbaths, pet dishes, toys, tires, flower pots, pools. Clean clogged roof gutters. Turn over wheelbarrows and wading pools when not in use.

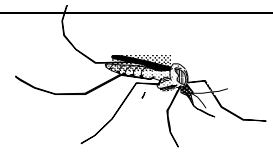
### **Where can I get more information on West Nile virus?**

Call your local health department or visit the following web sites:

Centers for Disease Control and Prevention [www.cdc.gov/ncidod/dvbid/arbor/arboinfo.htm](http://www.cdc.gov/ncidod/dvbid/arbor/arboinfo.htm)

VDH Office of Epidemiology [www.vdh.state.va.us/epi/newhome.htm](http://www.vdh.state.va.us/epi/newhome.htm)

American Mosquito Control Association [www.mosquito.org](http://www.mosquito.org)



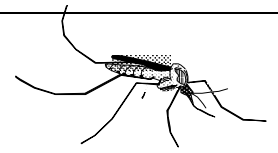
## Appendix C

### **NEWS BULLETIN TEMPLATE #1 (RISK LEVEL 1)**

## **ARLINGTON RESIDENTS ENCOURAGED TO HELP ELIMINATE MOSQUITO BREEDING PLACES**

Arlington health officials are asking residents to be more conscious this year of the need to eliminate mosquito-breeding places around their homes. "We are more concerned about mosquitoes this year than in the past for two reasons," said Dr. Susan Allan, chief of Arlington's Public Health Division. "First, we know we will have to contend with the Asian Tiger Mosquito again this year. Second, we are also concerned about any sign that the West Nile Virus, which can be transmitted by mosquitoes to humans, may be moving farther south." The Asian Tiger Mosquito is a smaller, more aggressive variety of mosquito than the normal breed usually found in Arlington and northern Virginia. It breeds readily in small, shallow pools of standing water, and can become a problem should preventive measures not be taken. "We would encourage residents to be on the lookout for small pools of water in discarded tires, tarps covering firewood, etc., that could be breeding grounds for mosquitoes," said Allan. "Taking away those easy targets will help limit the reproduction of this mosquito and help prevent the mosquito population from impacting our summer quality of life." Although there is no conclusive scientific evidence linking the Asian Tiger Mosquito with transmitting the West Nile virus to humans, the mosquito more common to the northeast United States, *Culex pipiens*, is known to have transmitted the virus to humans after ingesting the virus from infected birds. "Last summer and fall, the West Nile virus was responsible for 61 cases of encephalitis in New York City and surrounding counties, including seven deaths," noted Allan. "The virus had never before been identified in the western hemisphere. That is precisely why we want to monitor the situation closely this year. "Most birds simply carry the virus; crows and blue jays, however, belong to a genus that is particularly vulnerable to the virus. A crow carcass found near Baltimore last year was confirmed to have been a carrier.

"Should a citizen find a dead crow or blue jay that appears to have died as the result of natural causes, we would ask that the citizen call the Animal Welfare League at 703-931-9241," said Ann Beam, an administrative assistant to the Arlington Animal Welfare League. "It would also be helpful if the citizen could cover the carcass with a box, trash can, plastic or paper weighed down by rocks, although just calling the League is sufficient." The West Nile virus causes encephalitis, which is an inflammation of the brain. Mild symptoms associated with the virus include fever, head and body aches, often with swollen lymph glands. More severe infection is marked by headache, high fever and neck stiffness, which can progress to stupor, disorientation, coma, tremors, occasional convulsions, paralysis and in relatively rare instances, death. Treatment involves intensive supportive therapy for more severe cases. Elderly people are more susceptible to the virus than younger age groups. There is no vaccine to prevent contraction of the disease. Dogs and cats can be infected with the virus the same way as humans; however, there is only one verified case of a dog in 1982 in Botswana being infected with the virus and no verified cases of cats being infected. Animals cannot transmit the disease to other animals or humans.

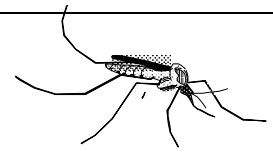


## Appendix D

### **NEWS BULLETIN TEMPLATE #2 (RISK LEVEL 1 AND/OR 2)**

#### **TIPS FOR ELIMINATING MOSQUITO BREEDING SITES AROUND THE HOME**

Dispose of cans, bottles and plastic containers properly. Store items to be recycled in covered trashcans or sealed bags. Dispose of discarded tires properly. Drill drainage holes in tires used for playground equipment. Clean roof gutters and down-spout screens regularly. Eliminate standing water on flat roofs. Turn over plastic wading pools, wheelbarrows and canoes when not in use. Do not leave trashcan lids upside down. Do not allow water to collect in the bottom of trashcans. Flush birdbaths and the bottoms of potted plant holder trays twice weekly. Adjust tarps over grills, firewood piles, boats and swimming pools to eliminate standing water. Regrade drainage areas and clean out debris in ditches to eliminate standing water in low spots. Clean and chlorinate swimming pools. Aerate garden ponds. Fix leaky water faucets and eliminate condensation puddles around air conditioners. Store pet food and water bowls indoors when not in use.



## Appendix E

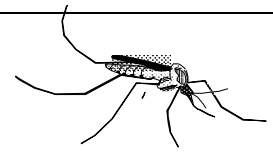
### **NEWS BULLETIN TEMPLATE #3 (RISK LEVEL 1 AND/OR 2)**

#### **ARLINGTON HEALTH OFFICIALS ASK FOR HELP IN DETECTING AND TRACKING WEST NILE VIRUS**

Arlington health officials are calling on citizens to help them monitor a potential return of the West Nile virus to the region. Last year a dead crow found in Baltimore was confirmed to be carrying the virus. "We urge Arlingtonians to be on the lookout for dead birds, especially crows and bluejays, that appear to have died as the result of natural or unknown causes," said Dr. Susan Allan, chief of Arlington's Public Health Division. "Crows and blue jays are especially susceptible to the virus, and we can detect the virus in the remains, which will enable us to detect and track the virus should it move into northern Virginia." "The virus cannot be contracted from handling bird carcasses," Allan said. "Still, bare-handed contact with any animal carcass should be avoided. Should a citizen find a dead crow or blue jay that appears to have died as the result of natural causes, we would ask that the citizen call the Animal Welfare League at 703-931-9241. The League also advises us that it would be helpful if the citizen could cover the carcass with a box, trash can, plastic or paper weighed down by rocks, although just calling the League will aid us in our monitoring endeavor.

" The West Nile virus is transmitted to humans by mosquitoes that have ingested the virus from infected birds. Most birds simply carry the virus; crows and blue jays, however, belong to a genus that is particularly vulnerable to the virus. The West Nile virus causes encephalitis, which is an inflammation of the brain. Mild symptoms associated with the virus include fever, head and body aches, often with swollen lymph glands. More severe infection is marked by headache, high fever and neck stiffness, which can progress to stupor, disorientation, coma, tremors, occasional convulsions, paralysis and in relatively rare instances, death. Treatment involves intensive supportive therapy for more severe cases. Elderly people are more susceptible to the virus than younger age groups. There is no vaccine to prevent contraction of the disease. "Last summer and fall, the West Nile virus was responsible for 61 cases of encephalitis in New York City and surrounding counties, including seven deaths," noted Allan. "The virus had never before been identified in the western hemisphere. That is precisely why we want to monitor the situation closely this year."

Dogs and cats can be infected with the virus the same way as humans; however, there is only one verified case of a dog in 1982 in Botswana being infected with the virus and no verified cases of cats being infected. Animals cannot transmit the disease to other animals or humans.



## Appendix F

### **NEWS BULLETIN TEMPLATE #4 (RISK LEVEL 2 AND/OR 3)**

#### **HEALTH OFFICIALS CONFIRM WEST NILE VIRUS IN BIRD CARCASS FOUND IN ARLINGTON**

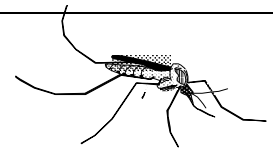
Arlington health officials have confirmed that a bird carcass found in the County has tested positive for the West Nile virus. "We have received confirmation from the Virginia state laboratory in Norfolk that a crow/blue jay carcass found in Arlington has tested positive for the virus," said Dr. Susan Allan, chief of Arlington's Public Health Division. "This is cause for concern and calls for increased vigilance on the part of health officials and citizens." The crow/blue jay was found {by a citizen/County employee at {location}}. The County has sent ### birds to Norfolk for testing. This bird is the first of ## to test positive. Results are still pending on ## others.

The West Nile virus is transmitted to humans by mosquitoes that have ingested the virus from infected birds. Most birds simply carry the virus; crows and blue jays, however, belong to a genus that is particularly vulnerable to the virus. The West Nile virus causes encephalitis, which is an inflammation of the brain. Mild symptoms associated with the virus include fever, head and body aches, often with swollen lymph glands. More severe infection is marked by headache, high fever and neck stiffness, which can progress to stupor, disorientation, coma, tremors, occasional convulsions, paralysis and in relatively rare instances, death. Treatment involves intensive supportive therapy for more severe cases. Elderly people are more susceptible to the virus than younger age groups. There is no vaccine to prevent contraction of the disease.

"Citizens, especially the elderly, are encouraged to stay indoors at dawn, dusk and the early evening when mosquitoes are most active. Wearing long-sleeved shirts and long pants when going outdoors will also help to reduce risk," said Allan. "Applying insect repellent sparingly to exposed skin or spraying thin clothing in accordance with the manufacturer's Directions for Use are also suitable precautions." Allan notes that an effective repellent will contain 20-30 percent DEET (N,N-diethyl-meta-toluidide).

"DEET in higher concentrations can cause side effects, especially in children, Allan said. "Also avoid putting repellent on the hands of younger children, as they may irritate the eyes and mouth. Do not put insect repellent on children less than three years old."

Arlington citizens who find dead crows and blue jays that have obviously not been the victims of collisions with an automobile or attacks from other birds or animals are asked to call the Arlington Animal Welfare League at (703) 931-9241, ext. 200/201, for pick up. Citizens are encouraged only to report the location of a dead bird carcass; there is no need for them to handle the carcass. "The virus cannot be contracted from handling bird carcasses," Allan said. "Still, bare-handed contact with any animal carcass should be avoided. The Animal Welfare League is equipped and trained in the recovery of animal carcasses."



## Appendix G

### **NEWS BULLETIN TEMPLATE #5 (RISK LEVEL 4)**

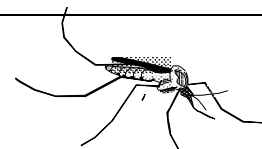
#### **HEALTH OFFICIALS CONFIRM CASE OF WEST NILE ENCEPHALITIS IN ARLINGTON**

Arlington health officials confirmed today a case of West Nile encephalitis in the County. "This is our first confirmed case of West Nile encephalitis. It underscores the need for citizens to be aware of the potential dangers of this virus and to take appropriate actions to protect themselves," said Dr. Susan Allan, chief of Arlington's Public Health Division. The individual is being treated {at an area hospital/Arlington Hospital}. "{General comment on patient's condition}, noted Allan.

The West Nile virus is transmitted to humans by mosquitoes that have ingested the virus from infected birds. Most birds simply carry the virus; crows and blue jays, however, belong to a genus that is particularly vulnerable to the virus. The West Nile virus causes encephalitis, which is an inflammation of the brain. Mild symptoms associated with the virus include fever, head and body aches, often with swollen lymph glands. More severe infection is marked by headache, high fever and neck stiffness, which can progress to stupor, disorientation, coma, tremors, occasional convulsions, paralysis and in relatively rare instances, death. Treatment involves intensive supportive therapy for more severe cases. Elderly people are more susceptible to the virus than younger age groups. There is no vaccine to prevent contraction of the disease.

"Citizens, especially the elderly, are encouraged to stay indoors at dawn, dusk and the early evening when mosquitoes are most active. Wearing long-sleeved shirts and long pants when going outdoors will also help to reduce risk," said Allan. "Applying insect repellent sparingly to exposed skin or spraying thin clothing in accordance with the manufacturer's Directions for Use are also suitable precautions." Allan notes that an effective repellent will contain 20-30 percent DEET (N,N-diethyl-meta-toluidide). "DEET in higher concentrations can cause side effects, especially in children, Allan said. "Also avoid putting repellent on the hands of younger children, as they may irritate the eyes and mouth. Do not put insect repellent on children less than three years old. "

###\_ NEWS from the Arlington County Government, Office of the County Manager 2100 Clarendon Boulevard, Suite 314, Arlington, Virginia 22201 Telephone: 703/228-3969 Fax: 703/228-3295



## Appendix H

### **NEWS BULLETIN TEMPLATE #6 (RISK LEVEL 4)**

#### **HEALTH OFFICIALS ASK CITIZENS TO PROTECT THEMSELVES FROM WEST NILE ENCEPHALITIS**

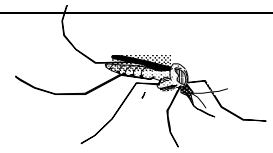
Prince William health officials are asking citizens to take appropriate action to protect themselves from mosquitoes carrying West Nile Virus. A confirmed case of West Nile encephalitis has been identified in the region. The individual is being treated {at an area hospital/Prince William Hospital}. {General comment on patient's condition}. The West Nile virus causes encephalitis, which is an inflammation of the brain. Mild symptoms associated with the virus include fever, head and body aches, often with swollen lymph glands. More severe infection is marked by headache, high fever and neck stiffness, which can progress to stupor, disorientation, coma, tremors, occasional convulsions, paralysis and in relatively rare instances, death. Treatment involves intensive supportive therapy for more severe cases. Elderly people are more susceptible to the virus than younger age groups. There is no vaccine to prevent contraction of the disease.

Citizens are encouraged to stay indoors at dawn, and dusk through early evening, when mosquitoes are most active. Individuals should wear long-sleeved shirts and long pants when going outdoors. An insect repellent should be used on exposed skin and on thin clothing in accordance with the manufacturer's Directions for Use. Effective repellents will contain 20-30 percent DEET. Repellents with higher concentrations of DEET can cause side effects, especially in children. Avoid putting repellent on the hands of younger children, as they may irritate the eyes and mouth. Also, fine-mesh screens should be used on windows and doors.

The mosquitoes that carry the West Nile Virus breed in standing water. Citizens should eliminate mosquito-breeding sites around the home. Water in bird baths, flowerpot trays, and outside pet water bowls should be changed every few days. Also, water in roof gutters, wading pools, trash cans, tires, and low spots on tarps over firewood and boats should be eliminated.

The West Nile virus is transmitted to humans by mosquitoes that have ingested the virus from infected birds. Many bird species carry the virus, but crows and blue jays, are particularly vulnerable. Additional information is available in a brochure entitled "Controlling Mosquitoes Around The Home" which is available at most government buildings, including libraries and schools.

###\_ NEWS from the Prince William Health Department. Telephone: 703/792-6300 Fax: 703/792-7368



## Appendix I

# Physician's Fact Sheet

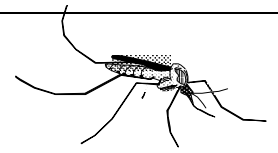
### A. Surveillance Criteria for Human Encephalitis and Meningitis

During the 1999 outbreak in New York, two-thirds of the encephalitis cases were associated with severe muscle weakness. Documentation of muscle weakness was based on neurologic examination and/or EMG findings. Therefore, case ascertainment should include encephalitis with muscle weakness, which may be more likely to represent WNV than other viral causes of encephalitis. (The background rate of viral meningitis is significantly higher than encephalitis, and mostly due to enteroviruses during the summer and fall months. Therefore, we do NOT intend to include viral meningitis in the surveillance criteria for Virginia unless there is evidence of WNV activity in Virginia or more resources are available. Although the increase in caseload may improve case detection, it will generate significantly more testing requires and reagents are limited.)

1. Recommended Criteria for Suspect Case of WNV - Any adult or pediatric patient with viral encephalitis (Criteria a,b and c below) with or without associated muscle weakness (Criteria d)
  - a. Fever  $\geq 38^{\circ}\text{C}$  or  $100^{\circ}\text{F}$ , and
  - b. Altered mental status (altered level of consciousness, agitation, lethargy) and /or other evidence of cortical involvement (e.g., Focal neurologic findings, seizures), and
  - c. CSF pleocytosis with predominant lymphocytes and/or elevated protein and a negative gram stain and culture, and/or
  - d. Muscle weakness (especially flaccid paralysis) confirmed by neurologic exam or by EMG.

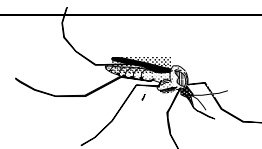
### B. Laboratory Testing for WNV

1. All suspect cases will first be reported to the LHD of VDH Office of Epidemiology using the Epi-1 reporting form or the initial case report form (Appendix-1). LHD staff will screen reports to assess that the clinical presentation meets the case criteria for viral encephalitis. If the case meets the surveillance criteria, the hospital or physician will be provided information on how to submit appropriate diagnostic specimens for testing.
2. The DCLS will perform all testing for WNV, including ELISA, PRNT, and RT-PCR on post mortem tissue as resources are available.



## **Physician's Fact Sheet (page 2)**

3. Health care providers will be informed that appropriate specimens for testing include:
  - a. CSF - Testing by IgM capture ELISA.
  - b. Sera - Acute and convalescent testing by IgM Capture and IgG ELISA testing.
  - c. IgM - positive sera should be confirmed by convalescent sera IgG (ELISA and PRNT).
  - d. Brain tissue - PCR and viral culture.
4. Physicians and laboratories need to complete all essential information on the laboratory submission forms, See attachment A "Virology / Immunology Form", including clinical and risk factor data, and symptom onset and specimen collection dates.
5. In the event that acute specimens (obtained within 8 days of illness onset) are negative by EIA testing, laboratory diagnosis of WNV will require that a follow-up (convalescent) blood test be obtained at least 2 weeks after the acute specimen to evaluate for the presence of convalescent antibody to the virus. Since most patients will have been discharged from the hospital, LHDs will need to have the capacity to arrange for obtaining convalescent blood specimens on all suspect case-patients who have indeterminate or negative initial test results.
6. LHDs will work with hospitals and physicians to encourage testing only for those patients that meet criteria for encephalitis. Patients with milder illnesses (e.g., fever and headache, fever and rash, fever and lymphadenopathy) or no symptoms (e.g., persons with a recent mosquito bite but no acute symptoms) do not need to be tested for WNV.
7. Health Department will be contacting physicians and patients to gather information using "Encephalitis / Initial Case Report Form" (attachment B).



Appendix J  
ENCEPHALITIS / INITIAL CASE REPORT FORM



**PATIENT INFORMATION**

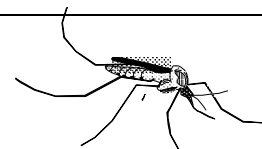
Last Name \_\_\_\_\_ First Name \_\_\_\_\_ County \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ Zip code \_\_\_\_\_ State \_\_\_\_\_  
Telephone-H (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_ W (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_ Date of Birth \_\_\_\_/\_\_\_\_/\_\_\_\_ Age \_\_\_\_\_  
Occupation: \_\_\_\_\_ Race: White Black Am Indian/Alaskan Asian Other  
Ethnicity: Hispanic Non-Hispanic Unknown Sex: Male Female Pregnant: Yes No Unknown

**CLINICAL INFORMATION**

Hospitalized? ☐ Yes ☐ No Hospital Name \_\_\_\_\_  
Street Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Medical record # \_\_\_\_\_ Date of admission \_\_\_\_/\_\_\_\_/\_\_\_\_ Date of discharge/transfer \_\_\_\_/\_\_\_\_/\_\_\_\_  
Date of first symptoms \_\_\_\_/\_\_\_\_/\_\_\_\_ Date of first neurologic symptoms \_\_\_\_/\_\_\_\_/\_\_\_\_  
Current Diagnosis: encephalitis meningoencephalitis meningitis other \_\_\_\_\_  
Initial Diagnosis: encephalitis meningoencephalitis meningitis other \_\_\_\_\_  
Fever ( $\geq 38^{\circ}\text{C}$  or  $100^{\circ}\text{F}$ ) Yes No Unknown Altered mental status Yes No Unknown  
Headache Yes No Unknown Stiff neck/Meningeal signs Yes No Unknown  
Seizures Yes No Unknown Muscle weakness Yes No Unknown  
Rash Yes No Unknown If yes, describe \_\_\_\_\_  
Other neurologic signs Yes No Unknown If yes, describe \_\_\_\_\_  
Other symptoms (current or 1 month before onset) \_\_\_\_\_  
Outcome Recovered Died Unknown If patient died, date of death \_\_\_\_/\_\_\_\_/\_\_\_\_

**LABORATORY INFORMATION / TEST RESULTS**

CSF (specify units) Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Abnormal? Yes No Unknown  
Glu \_\_\_\_\_ Prot \_\_\_\_\_ RBC \_\_\_\_\_ WBC \_\_\_\_\_ Diff: Segs \_\_\_\_\_%  
Lymphs \_\_\_\_\_%  
Gram stain \_\_\_\_\_ Culture \_\_\_\_\_  
CBC (specify units) Date \_\_\_\_/\_\_\_\_/\_\_\_\_ WBC \_\_\_\_\_ Diff: Segs \_\_\_\_\_% Lymphs \_\_\_\_\_%



MRI Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Results \_\_\_\_\_

CT Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Results \_\_\_\_\_

EEG Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Results \_\_\_\_\_

Microbiology / serology Results \_\_\_\_\_

**CURRENT TREATMENT**

**Type:**

**Date started:**(antiviral or antibacterial) \_\_\_\_\_

\_\_\_\_\_

**RISK FACTOR INFORMATION** (during 1 month before onset)

**Location**

**Date**

Travel outside USA?	Yes	No	Unk	_____	_____
Travel outside Virginia?	Yes	No	Unk	_____	_____
Travel outside county of residence?	Yes	No	Unk	_____	_____
Animal or arthropod contact?	Yes	No	Unk	_____	_____

If yes specify species: \_\_\_\_\_

**SPECIMENS BEING SUBMITTED TO DCLS FOR TESTING**

CSF	Yes	No	If yes, date collected ____/____/____	Initial	Repeat
			If no, was a lumbar puncture performed?	Yes	No
Serum	Yes	No	If yes, date collected ____/____/____	Initial	Repeat
Other	_____		Date collected ____/____/____	Initial	Repeat

**PHYSICIAN**

Last name \_\_\_\_\_ First name \_\_\_\_\_

Work address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Telephone (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_ Pager (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

**SUBMITTER**

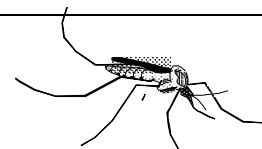
Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

Phone (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

**Date of Report:** \_\_\_\_/\_\_\_\_/\_\_\_\_



## Appendix K

### Virginia Laboratory Contacts

#### **VDACS**

**Harrisonburg Regional Animal Health Laboratory** (540) 434-3897  
116 Reservoir St., Harrisonburg, VA 22801 434-3880 Fax  
Dr. David Brown

**Ivor Regional Animal Health Laboratory** (757) 859-6221  
34591 General Mahone Blvd. 859-6428  
Ivor, VA 23866  
Dr. Jerry Dawson

**Lynchburg Regional Animal Health Laboratory** (804) 947-2518  
4832 Tyreeanna Road 947-2577  
Lynchburg, VA 24504  
Dr. Susan Gardner

**Warrenton Regional Animal Health Laboratory** (540) 347-6385  
272 Academy Hill Rd. 347-6404  
Warrenton, VA 20186  
Dr. Joe Garvin

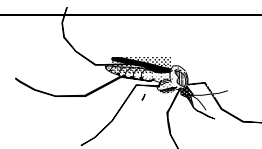
**Wytheville Regional Animal Health Laboratory** (540) 228-5501  
250 Cassell Road 228-6579  
Wytheville, VA 24382  
Dr. Jack Tate

#### **DCLS**

**Division of Consolidated Laboratories** (804) 786-9715  
1 North 14<sup>th</sup> St. 786-7905  
Richmond, VA 23219  
Dr. Denise Petit

#### **VDH**

**Norfolk VDH Laboratory** (757) 683-2746  
401 Colley Avenue  
Norfolk, VA 23507  
Dr. Alpha Diallo



## Appendix L

### **CONTACTS AND REFERENCES**

(to be completed by user)

#### **Adulticide Supplier**

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

#### **Animal Control Office**

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

#### **Animal Rehabilitators**

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

#### **Contract Mosquito Control Services**

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

#### **Contact Person for Health Care Community**

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

#### **Department of Agriculture**

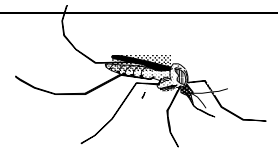
Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

#### **Ditch/Waterway Maintenance**

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

#### **Epidemiology**

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_



## Medical Society

Contact person: \_\_\_\_\_(ph)\_\_\_\_\_

## Hospital #1 Infection Disease Control Physician

Contact person: \_\_\_\_\_(ph)\_\_\_\_\_

## Hospital #1 Infection Disease Control Practitioner

Contact person: \_\_\_\_\_(ph)\_\_\_\_\_

## Hospital #2 Infection Disease Control Physician

Contact person: \_\_\_\_\_(ph)\_\_\_\_\_

## Hospital #2 Infection Disease Control Practitioner

Contact person: \_\_\_\_\_(ph)\_\_\_\_\_

## Hospital #3 Infection Disease Control Physician

Contact person: \_\_\_\_\_(ph)\_\_\_\_\_

## Hospital #3 Infection Disease Control Practitioner

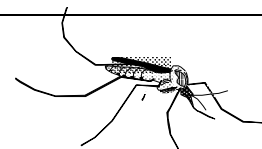
Contact person: \_\_\_\_\_(ph)\_\_\_\_\_

## Hospital #4 Infection Disease Control Practitioner

Contact person: \_\_\_\_\_(ph)\_\_\_\_\_

## Hospital #4 Infection Disease Control Physician

Contact person: \_\_\_\_\_(ph)\_\_\_\_\_



## Hospital #6 Infection Disease Control Practitioner

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

## Laboratories

1. Avian testing lab: (Name) \_\_\_\_\_

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

2. Mammal testing lab: (Name) \_\_\_\_\_

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

3. Human specimen lab: (Name) \_\_\_\_\_

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

## Larvicide Supplier

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

## Mosquito Control Equipment Supplier

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

## Mosquito Control Office

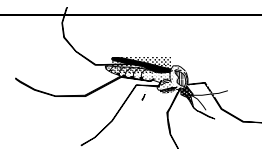
Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

## Mosquito Surveillance Equipment Supplier

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

## Pesticide Applicators Licensing

Contact person: \_\_\_\_\_ (ph) \_\_\_\_\_

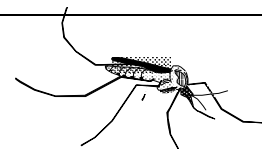


## Public Information Office

Contact person: \_\_\_\_\_(ph)\_\_\_\_\_State

## Veterinary Society

Contact person: \_\_\_\_\_(ph)\_\_\_\_\_



Appendix M

**West Nile Virus Surveillance  
VA Animal Reporting and Submission Form**

VDH ID number \_\_\_\_\_  
VDACS ID number \_\_\_\_\_  
DCLS ID number \_\_\_\_\_

NWHS ID number \_\_\_\_\_  
CDC ID number \_\_\_\_\_

Person completing form:

Name: \_\_\_\_\_  
Agency: \_\_\_\_\_

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_  
Phone: \_\_\_\_\_

Person reporting dead/sick animal(s):

Date of initial report: \_\_\_\_/\_\_\_\_/\_\_\_\_  
Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Date dead/sick animal(s) found or seen: \_\_\_\_/\_\_\_\_/\_\_\_\_

Number of dead/sick animal(s) seen: \_\_\_\_\_ Any evidence of trauma: yes: ☐ no: ☐

Species of animal(s): \_\_\_\_\_

Location of animal(s)

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ County: \_\_\_\_\_

Zip Code (MOST IMPORTANT): \_\_\_\_\_

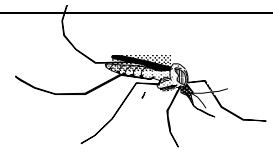
**Animals should only be submitted for testing if the specimen is fresh (dead < 48 hours).**

Date animal(s) collected: \_\_\_\_/\_\_\_\_/\_\_\_\_

Collector: Name \_\_\_\_\_ Agency: \_\_\_\_\_

Date shipped for testing: \_\_\_\_/\_\_\_\_/\_\_\_\_

Place shipped to: \_\_\_\_\_



## Appendix N

### A. Minimum Recommended Mosquito Monitoring Package

Not every jurisdiction will consider it feasible to establish and conduct their own mosquito monitoring program. However, the following information was provided by the Mosquito Control Division, Norfolk City Health Department as an example of equipment and supplies suitable for establishing a small local monitoring program.

***Step I***      ***GPS Unit***      \$3,000.00 ea.

***Step II***      **Larvae Sampling**

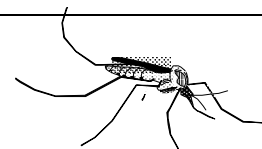
- 1) Dipper      \$10.70 ea
- 2) Whirl Bags      \$73.92 / 500
- 3) Rack for Bags      \$20.00 ea.

**Adult Surveillance**

- 1) CDC Light Traps      \$80.00 ea.
- 2) 6 volt Batteries      \$1.16 ea
- 3) ½ Gal Cooler w/spout      \$3.00 ea.
- 4) Dry Ice      \$21.60 / 30 lb.
- 5) Rope      \$1.00 / 25 ft.

**Lab**

- 1) Microscope (Stereo)      \$410.00 ea.
- 2) Aspirator      same
- 3) Tubes for Aspirator      same
- 4) Petri Dishes      \$121.00 / 500
- 5) Forceps      \$15.00 ea.
- 6) Kill Jars      \$3.00 ea.
- 7) Cotton      \$3.00/roll
- 8) TEA      \$24.25 / 100 ml
- 9) Ethyl Acetate      \$146.84 / 4 liters
- 10) Bleach for cleaning      \$1.00 / gal



## Appendix O

### DISTRIBUTOR LIST

**\*\*\* It should noted, that before embarking on a program of local mosquito control, approved training and certification in the proper use and application of pesticides must be obtained from authorized state and/or federal agencies.**

**\*\*\* The representation of the following businesses does not constitute an endorsement, real or implied, of those businesses or their products by any person, department, organization, or agency helping to create this response plan. Other businesses may exist which manufacture or market the same or similar equipment or supplies and may be able to provide equal or superior products and/or service.**

***Hausherrs Machine Works***

Old Freehold Road  
Toms River, NJ 08753  
(732) 349-1319

CDC Light traps, Aspirators and Aspirator  
Tubes

***Fisher Scientific***

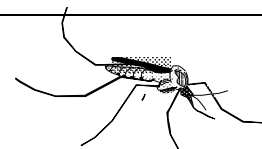
PO Box 4829  
Norcross, GA30091  
1-800-766-7000

TEA, Ethyl Acetate, Whirl Bags, Petri  
dishes, microscopes and other supplies

***Bio Quip Products***

17803 LaSalle Ave.  
Gardena, CA 90248-3602

Dippers, Kill Jars, and Forceps



## Appendix P

# State of Maryland Avian Sampling Procedures

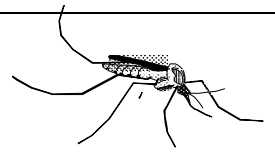
### Dead Bird Surveillance

#### Purpose:

Wild birds (such as crows) can be infected by WNV. Some of these infected birds may die of WNV infection. Maryland State agencies will check selected dead bird specimens to find out if the death was caused by WNV infection. Together with other sources of information, these findings from dead bird surveillance will help us understand the patterns of WNV infection (if any) in Maryland. The help of the public will be requested to find out where wild bird deaths have occurred. Maryland Department of Natural Resources hotline personnel will then decide whether a particular dead bird specimen should be retrieved and tested for WNV infection.

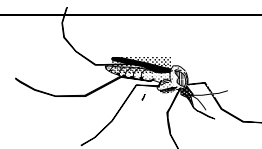
#### Actions:

1. The Maryland Department of Natural Resources (DNR) Police together with DHMH will operate a hotline (**1-888-584-3110**) for the public to report wild bird deaths in Maryland. This hotline will be publicized in the initial public information campaign (see Public Information Campaign, page 12). The hotline will inform callers that dead birds cannot transmit WNV infection to human beings or to animals. Information about reported bird deaths will be collected using the "DNR West Nile virus Report Form."
2. If the dead bird is to be tested, the report will be referred to a local public health department that will coordinate the pickup and examination of the dead wild bird(s) based on information supplied by the caller.
3. Not every dead bird reported will be selected for examination. Many bird deaths have no relationship to WNV disease. Sometimes, decomposition of the bird prevents successful examination.
  - a) Depending on the dead bird's condition and the circumstances in which it was found, the caller may be asked to dispose of the dead bird's body in an appropriate manner.
  - b) However, if the dead bird is selected for examination, and if the caller is willing, they will be instructed how to safely put the body into a plastic bag on ice. The dead bird's body will be picked up and delivered for testing by the local health department to DHMH Laboratories Administration, Baltimore, according to instructions provided by the laboratory. DHMH laboratory scientists are working with MDA and DNR personnel to recognize signs of WNV and other infections in birds



## State of Maryland Avian Sampling Procedures (cont.)

4. Results of testing of dead birds will be collected and analyzed by an epidemiologist at the DHMH Center for Veterinary Public Health.



## Appendix Q

# State of Maryland Equine (Horse) Surveillance

## Equine (Horse) Surveillance

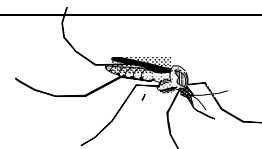
### Purpose:

**In last year's outbreak, some horses in eastern Long Island were infected with WNV. Horses are an important part of Maryland's economy. It is important to alert veterinarians about WNV disease, and about how to test horses if WNV or other serious disease is suspected.**

### Actions:

1. DHMH and MDA will notify veterinarians about WNV infection in horses. The notification letter will tell veterinarians what kind of illness to look for, and how to test the horse for WNV or other serious viral infections. The document, "WNV Surveillance in Maryland: Maryland Department of Agriculture: Plan of Activities contains additional information.
2. If a horse is suspected of having WNV infection, veterinarians will be asked to collect appropriate specimens.
3. Results from testing of horse blood samples may take several weeks to complete.
4. Necropsies (careful examinations of the bodies of dead horses for disease) will be offered free of charge to owners of horses whose deaths suggest WNV or other serious diseases causing encephalitis are suspected as the cause of death. Laboratories of the MDA will perform necropsies of horses when WNV or other causes of encephalitis are suspected as the cause of death.
5. Results of horse blood testing and of horse necropsies will be collected and analyzed.

**Note:** Protection of horses involves keeping horses stabled inside during high mosquito feeding times, i.e., dusk and dawn. Insect proofing of stables and use of repellents are strongly recommended. There is no vaccine available to protect horses from WNV infection.



## State of Virginia Avian and Mammal Surveillance Activities Plan

### I. Introduction

In conjunction with their local, state and federal partners, the Virginia Department of Health (VDH) will place a high priority for West Nile virus (WNV) surveillance on information from sick or dead wild birds, especially crows. This surveillance system requires individuals seeing birds sick with neurologic signs or dead to report them. This report should include detailed date and location information and should be given to their local health departments (LHD) (Appendix 1). The effectiveness of sick or dead bird reporting will be enhanced by collaboration with those groups and individuals most likely to find sick or dead birds, such as agencies whose employees spend considerable time out of doors (parks, zoos, wildlife, transportation, etc.), and members of birding and outdoor recreational organizations.

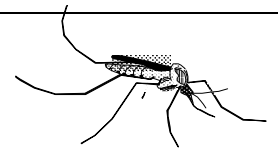
### II. Objective

Provide an appropriate protocol for utilizing birds and mammals for WNV surveillance in Virginia.

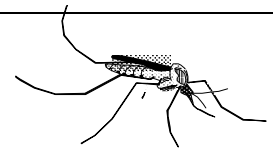
### III. Implementation Plan

This surveillance involves two components: a **Reporting System** for sightings of dead birds to track possible increases due to an appearance of WNV, and a **Testing System** of selected sick or dead birds and mammals as well as clinically normal sentinel birds and mammals for the disease. In all cases, the initial point of contact for the public can be the LHD of the county or city in which they are located. However, inquiries about domestic animals can go directly to the nearest Virginia Department of Agriculture and Consumer Services Regional Animal Health Laboratory (RAHL) (Appendix 2) and inquiries about wildlife other than birds can go directly to the nearest Virginia Department of Game and Inland Fisheries (VDGIF) office (Appendix 3). The following statements apply to all types of bird and mammal surveillance.

- (1) **Permits** – VDGIF is the designated state agency for issuing salvage permits to allow LHDs to transport (or delegate transport) of birds and RAHLs to possess birds. As subpermittees, LHDs and RAHLs must keep records of all birds picked up and transported. Any citizen in possession of a bird must have an ID number from the LHD that authorized the collection or transport of the bird.
- (2) **Impact of Specimen Collection** - To minimize the potential impact on individual animals and populations of animals, when possible samples for WNV surveillance will be



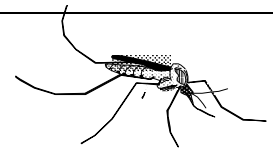
- (3) obtained from animals that have died, rather than taking samples from live animals. It is anticipated that the only samples taken from live animals would be a blood specimens for antibody testing, although it is possible that a veterinarian might also take a cerebrospinal fluid (CSF) specimen from an ill animal for diagnostic purposes. To reduce the stress on sentinel birds or mammals, if possible blood specimens should be utilized for more than one diagnostic test, for example, other surveillance tests required for control of other disease agents.
- (4) **Laboratory Test Interpretation** - Clear guidelines for interpretation of laboratory tests will be developed by the VDH and the laboratories performing testing (Virginia Department of Agriculture and Consumer Services (VDACS), Division of Consolidated Laboratory Services [DCLS], Norfolk Public Health Laboratory [NPHL]). The need to determine whether test results indicate current or previous infection will be considered to avoid taking public health or animal health actions based on false positive or false negative results. This will also help to avoid providing an inaccurate diagnosis to owners and veterinarians attempting to determine the cause of an illness in a pet or domestic animal. This issue will be particularly critical for interpretation of results from single serologic specimens or from other screening tests that are developed. Testing of birds and mammals and reporting of results by laboratories will occur in a timely manner, allowing for appropriate quality control.
- (5) **Release of Information** - Rapid sharing of surveillance results with government agencies and the public is essential for development of appropriate disease prevention and control measures. However, some confidentiality should attach to identification of affected privately owned domestic birds and mammals to assure individual privacy of the owner and the treating veterinarian, if any. Therefore, to encourage reporting, owners' names and street addresses, treating veterinarians' names and street addresses, and names and addresses of persons submitting specimens shall be kept confidential. Information that will be available to agencies and the public with respect to domestic birds and mammals will include the town and county where the specimen was collected, the species, the date of collection, and the WNV test results.
- A. Reporting System - Sick or Dead Wild Birds
1. Citizens seeing birds sick or dead should report them, including detailed date and location information, to their LHD.



2. based on species, cause of death and freshness (died within the past 24 hours).
3. Crows and blue jays (*Corvidae* family) and raptors (hawks and falcons) will take priority; however, reports of individual sick or dead wild birds of other species will be logged in by the LHD, but will not routinely be submitted for testing. Groups of sick or dead wild birds of other species will be referred to the nearest VDACS Office of Pesticide Services (OPS) (Appendix 4) for investigation and determination of suitability for testing (VDGIF local offices and RAHLs can be called if OPS availability is limited at that time and place). If USDA Wildlife Services is called to investigate such an incident, they will communicate findings to OPS and VDH Health District. If testing is recommended, a sample of birds will be transported to a RAHL where a determination will be made as to type of testing needed (pesticide, WNV, etc.). In all cases, the LHD and the VDH Office of Epidemiology should be informed of the outcomes of investigations and laboratory testing.
4. All calls should be logged on standardized forms (Attachment A) provided by VDH with the date, time, location of dead bird, number of birds, name, address and telephone number of caller. A summary of the previous weeks reports should be sent via email each Monday to the Office of Epidemiology in a format to be determined by OE.
5. If the bird(s) will be submitted for testing, the caller will be given a case number to verify contact was made with the health department. The case number must be with the bird(s) while in transport.

#### **B. Testing System - Sick or Dead Wild Birds**

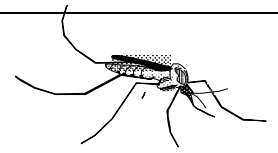
1. Birds will be necropsied at one of the five RAHLs (Appendix 2). Specimens may be submitted directly to the laboratory by LHD staff, Animal Control Officers, VDGIF staff, members of conservation or wildlife groups, or the individual citizen reporting the dead birds. Alternatively, the specimens may be submitted to the LHD, which will forward them to the nearest RAHL.
2. Because of their sensitivity and specificity for WNV, crows, blue jays and raptors will receive priority for necropsies, particularly if they are reported as sick or freshly dead (within the past 24 hours). Unusual sickness or die-offs of other species of birds should be investigated as outlined in A.3. and birds should only be submitted if other causes of death are ruled out.



3. Birds should be handled with gloves or some other means of avoiding direct contact. Citizens should be instructed to place each dead bird in a plastic bag, tie it shut and then place in a second bag and tie it shut. The double-bagged bird can then be placed in a sturdy, waterproof container with ice until delivered to a laboratory.
4. containers, but this is anticipated to be more costly for the local agencies. Birds should be stored on ice or in a Leak-proof, reusable coolers (ice chests) are recommended for purchase by local agencies for bird submissions. They should be marked with indelible ink with the county name, address, and phone number, so that the RAHL can ship them back to the local agencies after receiving the birds. Local agencies may also use disposable leak-proof, sturdy shipping refrigerator and should be transported to a RAHL in the presence of a cold pack (preferred) or wet ice. If carcasses are stored more than 24 hours before transporting to the laboratory, they should be frozen.
5. For each specimen(s) submitted, the RAHL will determine, based on the history associated with the submission and the results of the necropsy examination, whether testing for WNV is warranted. (All testing by Virginia laboratories is dependent on availability of appropriate tests and supplies.) Portions of the brain, heart, liver, and kidney will submitted for histopathology and a second portion of the same tissues will be held frozen on all specimens submitted. Any rapid screening tests developed for WNV, for example immunohistochemistry or immunofluorescence, will be utilized by RAHL on tissue specimens as appropriate. Any specimen for which a cause of death cannot readily be identified at necropsy will have tissues forwarded to the DCLS for virus isolation (VI) and/or Reverse Transcriptase-Polymerase Chain Reaction (RT-PCR) testing to detect WNV. An exception is in the eastern region where virus isolation will be conducted at the NPHL. Any positive VI cultures will be submitted to DCLS for confirmation of results with RT-PCR.
6. If serum is available from these specimens, it will be forwarded to the NPHL for IgM Capture Enzyme-Linked Immunosorbent Assay (MAC-ELISA) testing.

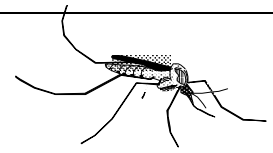
### **Testing System - Asymptomatic Birds**

The VDH will work with federal, state, and local agencies to develop the most feasible sentinel bird surveillance program for each geographic area and will support the collection of serologic specimens by local or other state agencies, as resources permit. Emphasis will be placed on using existing flocks rather than establishing new flocks, on testing serologic specimens that have already been taken as part of routine testing rather than



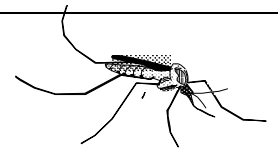
taking new specimens, and on using existing mechanisms for collection of wild birds. Emphasis will also be placed on establishing partnerships and training to accomplish specimen collection. Prioritization for sampling and testing will be provided to those counties that are most epidemiologically at risk based on bird migration patterns and vector availability.

1. Serum from sentinel birds will be forwarded to the NPHL for MAC-ELISA testing. (All testing by Virginia laboratories is dependent on availability of appropriate tests and supplies.)
2. The Virginia office of the USDA, Wildlife Services will identify options for collecting specimens for WNV testing from wild birds killed in connection with wildlife damage projects to protect agriculture, property, and human health and safety throughout the state. The bird species will likely include gulls, crows, Canada geese, starlings, and pigeons. These could include birds removed for nuisance control from landfills and airports, or in local Canada geese roundups. Live birds tested could also include those maintained in wild bird flocks such as those in zoos and game farms. Samples collected by USDA Wildlife Services will be tested by the National Wildlife Health Center in Madison, Wisconsin and the results communicated to VDH.
3. VDACS will assist VDH in identifying options for testing existing flocks of domestic birds. These birds could include those that already have routine blood samples taken, such as birds going to shows, birds in existing flocks that could be easily tested (for example, 4-H birds), or birds on egg farms.
4. A coordinated and comprehensive plan will be developed among the agencies participating in sentinel bird surveillance for sampling a sufficient number of birds to provide appropriate representation of a geographic area. For example, if existing domestic bird flocks are used or sentinel surveillance flocks are established, efforts should be made to sample a minimum of five birds per area, and six areas per county, at least every other week.
5. Mechanisms will need to be developed to distinguish previous from current infections. These may include testing hatch year birds that were not alive the previous year or requiring a four-fold rise in titer between two specimens taken two weeks apart.



## Testing System – Sick Domestic Birds and Mammals

1. Rabies Suspect Animals - In Virginia, mammals that have died of encephalitis are more likely to have died of rabies than WNV, and rabies can be transmitted to people by those mammals before they die (unlike WNV for which no direct transmission between animals and humans has been documented). Thus, it continues to be critical that all mammals with neurologic signs that have contact that could result in rabies exposure to people, pets, or domestic animals be submitted for rabies testing to one of the DCLS Rabies Laboratories (Richmond, Luray, Abingdon) or one of the District Rabies Laboratories (Fairfax or Norfolk) according to the guidelines established by those laboratories. WNV testing of dead mammals that have been submitted for rabies testing will take place according to the following guidelines:
  - a. Selected mammals that are negative for rabies will be screened for WNV with VI and RT-PCR. High priority will be given to equine specimens. Other species will be tested for WNV as resources permit and after consultation with VDH and VDACS.
  - b. A priority for WNV testing will be given to specimens from rabies-negative dead horses because of the previous incidence of illness and death in horses.
  - c. Other domestic and wild species will be tested as resources permit, and for research purposes to document the frequency of WNV-related illness and death in mammals.
2. Other Animals - Of all the types of bird and mammal surveillance systems for WNV, surveillance by testing sick animals is likely to be the least sensitive and specific system, because most animals that become ill with clinical signs of encephalitis are more likely to have other causes of illness than WNV. However, occasional cases of WNV infection may be detected by laboratory testing, particularly in sick horses and exotic birds, and such information will be utilized as part of the geographic and temporal surveillance for the disease. Parameters for evaluation and testing sick animals for WNV include the following:
  - a. VDACS, with assistance from VDH, will develop information to provide to owners and breeders of horses and exotic birds and to veterinarians to increase awareness about WNV and importance of reporting symptomatic animals.



- b. Animals with neurologic signs should receive a veterinary evaluation and appropriate diagnostic testing, including both rabies and WNV within the differential diagnosis list, particularly if the animal is from a geographic area associated with a high risk of WNV transmission;
- c. If WNV is considered to be a possible diagnosis, acute and convalescent serologic specimens should be taken. Whether CSF specimen testing will be valuable has yet to be determined;
- d. Private practice veterinarians with questions about whether WNV testing is indicated should contact the nearest RAHL (Attachment B);
- e. Laboratory testing of sick animals will be conducted by RAHL. Private veterinarians should contact the nearest laboratory before submitting specimens. For each specimen(s) submitted, the RAHL will determine, based on the history associated with the submission and the results of the necropsy examination, whether additional testing for WNV is warranted. Portions of the brain, heart, liver, and kidney will be submitted for histopathology and a second portion of the same tissues will be held frozen on all specimens submitted. Any rapid screening tests developed for WNV, for example immunohistochemistry or immunofluorescence, will be utilized by RAHL on tissue specimens as appropriate. Any specimen for which a cause of death cannot readily be identified at necropsy will have tissues forwarded to the DCLS for VI and/or RT-PCR testing to detect WNV. An exception is in the eastern region where virus isolation will be conducted at the NPHL. Any positive VI cultures will be submitted to DCLS for confirmation of results with RT-PCR.